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09/607,179	06/29/2000	Yuan Chang	45185-CA/JPW/SHS	1263

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EXAMINER	
SCHLAPKOHL, WALTER	

ART UNIT	PAPER NUMBER
1636	

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/607,179	CHANG ET AL.	
	Examiner	Art Unit	
	Walter Schlapkohl	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52 and 53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/28/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt is acknowledged of the papers filed 11/28/2005 in which claim 52 was amended. Claims 52-53 are pending and under examination in the instant case.

Any rejection made in the previous Office action not recited herein is hereby withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 52-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. **This is a new rejection not necessitated by Applicant's amendment.**

The claims are drawn to isolated peptides which (i) are encoded by a nucleic acid of at least 30 nucleotides in length having a sequence which constitutes a portion of the sequence set forth in SEQ ID NO: 14, and (ii) which bind to an antibody in a binding reaction that is determinative of a herpesvirus associated with Kaposi's sarcoma, which herpesvirus is (a) present in and recoverable from the HBL-6 cell line (ATCC Accession No. CRL 11762) or (b) has a genome having substantial sequence identity with the sequence set forth in SEQ ID NO: 1. The claims encompass any peptide to which an antibody can bind as long as that peptide is encoded by a sequence that constitutes a portion of the sequence set forth in SEQ ID NO: 14 and as long as the binding reaction is determinative of a herpesvirus associated with Kapsoi's sarcoma(KS) as present in the HBL-6 cell line or as present in a such a herpesvirus with "substantial sequence identity with the sequence set forth in SEQ ID NO: 1." Examiner has interpreted a an antibody binding reaction that is determinative of a herpesvirus associated with Kaposi's sarcoma to mean that the binding reaction is specific enough to determine whether an SK-associated herpesvirus is present to the exclusion of other herperviruses. In other words, the binding reaction must indicate the presence of herpesvirus associated with KS and distinguish such a

herpesvirus from other herpesviruses that may or may not also be present. The claims do not provide any structural information with regard to which peptides encoded by a nucleic acid which constitutes a portion of SEQ ID NO: 14 are capable of distinguishing between a herpesvirus associated with KS and any other herpesvirus. Thus, the rejected claims comprise a set of peptide sequences that are defined by their function.

To provide adequate written description and evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of a complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, and any combination thereof. The specification describes a full length sequence for the open reading frame 21 (SEQ ID NOs: 14 and 15)(page 20, lines 25-27). The specification also "provides a method to select specific regions on the polypeptide encoded by the isolated DNA molecule of the DNA virus to generate antibodies" and proposes the use of hydrophilic amino acids of such sequences for use as immunogens (page 36, lines 8-30). However, no description is provided of a single peptide encoded by a nucleic acid of at least 30 nucleotides in length having a sequence which constitutes a

portion of the sequence set forth in SEQ ID NO: 14 which also binds to an antibody in a binding reaction that is determinative of a herpesvirus associated with Kaposi's sarcoma and does not bind to any other kind of herpesvirus.

Furthermore, the disclosure of full length SEQ ID NO: 14 does not provide enough information to extrapolate which peptides encoded by a portion of this sequence would fulfill the claim limitations. Thus it is impossible to extrapolate from the example described herein those nucleic acid molecules that encode peptides which would necessarily meet the structural/functional characteristics of the rejected claims.

The prior art does not appear to offset the deficiencies of the instant specification in that it does not describe a set of peptides encoded by a portion of a nucleic acid capable of distinguishing herpesviruses associated with KS from other herpesviruses. Josephs et al (*J. Virol.* **65**:5597-5604, 1991; of record) describe a peptide encoded by a nucleic acid that is at least 30 nucleotides in length and to which an antibody binds. Importantly, this peptide (Glycoprotien H) is produced by HHV-6, a herpesvirus known to be associated with KS. Liu et al (*Virology* **197**: 12-22, 1993, of record) also teach the production of the HHV-6 Glcyoprotein H and its interaction with an antibody (see for example the Abstract and Figure 1). Yet neither Liu et

al nor Josesphs et al teach such polypeptides such that they are determinative of a herpesvirus associated with KS and such that the antibody binding reaction can distinguish a herpesvirus associated with KS from other herpesviruses.

Given the very large genus of peptides encompassed by the rejected claims, and given the limited description provided by the prior art and specification with regard to the peptides capable of fulfilling the claim limitations of claims 52-53, the skilled artisan would not have been able to describe the broadly claimed genus of peptides encoded by nucleic acids of at least 30 nucleotides in length having a sequence which constitutes a portion of the sequence set forth in SEQ ID NO: 14 such that when an antibody binds to the peptide the binding reaction is determinative of a KS-associated herpesvirus as opposed to any other herpesvirus. Thus, there is no structural/functional basis provided by the prior art or instant specification for one of skill in the art to envision those peptide and/or nucleic acid sequences that satisfy the functional limitations of the claims. Therefore, the skilled artisan would have reasonably concluded applicants were not in possession of the claimed invention for claims 52-53.

Response to Arguments

Although this is a new rejection not necessitated by Applicant's amendment, Examiner has taken into consideration Applicant's arguments of record in response to the previous written description rejection.

Applicant's representative has argued that claim 52 makes clear that the claimed isolated peptide is encoded by a nucleotide sequence which is at least 30 nucleotides in length and is within SEQ ID NO: 14, which peptide uniquely defines a herpesvirus associated with KS.

Applicant' representative has also argued that it would be routine to identify a large number of such ≥30 nucleotide sequences from the nucleotide sequence of SEQ ID NO: 14 based on the specification.

Applicant's representative has also argued that using tools in the prior art such as a BLAST search of publicly accessible peptide databases along with the polypeptide encoded by SEQ ID NO: 14, i.e., using SEQ ID NO: 15 as a query sequence, one of ordinary skill in the art could easily determine which peptides encoded by such a ≥30 nucleotide sequences uniquely define a herpesvirus associated with KS (i.e., determinative of a KS-associated herpesvirus).

Applicant's representative maintained that the provision of the complete nucleotide sequence of SEQ ID NO: 14 is sufficient disclosure of a relevant identifying characteristic, i.e., structure, to show that Applicant was in possession of the claimed genus.

The arguments presented have been fully considered but are respectfully found unpersuasive.

Although Applicant has disclosed a full length sequence of the open reading frame which encodes a thymidine kinase protein apparently unique to the herpesvirus taught in the instant application, Applicant's claims are drawn to any isolated peptide having a sequence which constitutes a portion of the sequence encoded by the sequence set forth in SEQ ID NO: 14 and which are determinative of a herpesvirus associated with KS as opposed to any other herpesvirus. Applicant has not described what peptide sequences fulfill the claim limitations, i.e. which peptides from SEQ ID NO: 15 can distinguish the claimed herpesvirus associated with KS which is either (a) present in and recoverable from the HBL-6 cell line or (b) has a genome having substantial sequence identity with the sequence set forth in SEQ ID NO: 1 from other herpesviruses. Thus, Applicant's assertion that the provision of the complete nucleotide sequence of SEQ ID NO: 14 is sufficient disclosure of a relevant

identifying characteristic is not persuasive because the full length sequence is not descriptive of portions that either do or do not fulfill the structural claim limitations.

While it may be routine in the art for one of ordinary skill in the art to identify desired or homologous sequences using the BLAST search tool, Applicant is reminded that the factors to be considered in a written description rejection include disclosure of a complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, and any combination thereof. Therefore, in a matter of written description, the burden is on the Applicant to describe the structures, physical and/or chemical properties, functional characteristics and structure/function correlations as they apply to the claimed invention, not to inform one of ordinary skill in the art of methods whereby one can perform further searching or experimenting in order to determine the structures and other physical or chemical requirements needed in order to fulfill the claim limitations. In fact, such arguments which direct one of ordinary skill in the art to the use of search tools to determine which peptides do or do not meet the claim limitations lend credence to the Office's argument that Applicant is not in

a position to describe such sequences and therefore not in possession of such sequences.

Claims 52-53 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the full length SEQ ID NO: 14, does not reasonably provide enablement for the portions of the polypeptide (i.e. fragments) that uniquely define a herpesvirus associated with KS. The specification does not enable any person skilled in the art to which it pertains to make and use the invention commensurate in scope with these claims.

The test of enablement is whether one skilled in the art could make and use the claimed invention from the disclosure in the specification coupled with information known in the art without undue experimentation (United States v. Teletronics, 8 USPQ 2d 1217 (Fed. Cir. 1988)). Whether undue experimentation is needed is not based upon a single factor but rather is a conclusion reached by weighing many factors. These factors were outlined in *Ex parte Forman*, 230 USPQ 546 (Bd. Pat. App. & Inter. 1986) and again in *In re Wands*, 8 USPQ2d 1400 (Fed. Cir. 1988), and the most relevant factors are indicated below.

Nature of the invention: The nature of the invention is any polypeptide fragment encoded by a portion of SEQ ID NO: 14 of

thirty nucleotides or greater, wherein said polypeptide fragment binds to an antibody in a binding reaction that necessarily and selectively defines a herpesvirus that is associated with KS which KS is either (a) present in and recoverable from the HBL-6 cell line or (b) has a genome having substantial sequence identity with the sequence set forth in SEQ ID NO: 1.

Scope of the invention: The scope of the invention is very broad, encompassing any sized fragment found within the 580 amino acid protein encoded by SEQ ID NO: 14. However, it is unclear which of these peptides necessarily and selectively defines a herpesvirus that is associated with KS.

State of the art and Level of skill in the art: The state of the art is silent with regard to which peptide fragments encoded by portions of SEQ ID NO: 14 necessarily and selectively define a herpesvirus that is associated with KS. Josephs et al (*J. Virol.* **65**:5597-5604, 1991; of record) describe a peptide encoded by a nucleic acid that is at least 30 nucleotides in length and to which an antibody binds. Importantly, this peptide (Glycoprotien H) is produced by HHV-6, a herpesvirus known to be associated with KS. Liu et al (*Virology* **197**: 12-22, 1993, of record) also teach the production of the HHV-6 Glcyoprotein H and its interaction with an antibody (see for example the Abstract and Figure 1). Yet neither Liu et al nor Josesphs et

al teach such polypeptides such that they are determinative of a herpesvirus associated with KS and such that the antibody binding reaction can distinguish a herpesvirus associated with KS from other herpesviruses. The state of the art also clearly identifies proteins that are not encoded by SEQ ID NO: 14, many of which may (or may not) contain peptides subsequences of SEQ ID NO: 15. Because it is unclear which portions of SEQ ID NO: 14 encode peptides that are also encoded by other nucleic acids, especially other viruses to be distinguished from the claimed herpesvirus associated with KS, it is unpredictable which of these peptides encoded by portions of SEQ ID NO: 14 uniquely define a herpesvirus associated with KS.

Nature of working examples and Guidance provided by the specification: The instant specification only defines the full-length protein that is encoded by SEQ ID NO: 14, which appears to uniquely define the herpesvirus characterized in the instant specification. However, there is no dissection of the protein, whereby the fragments of said protein (i.e., those portions encoded by a portion of SEQ ID NO: 14) capable of binding to an antibody such that the binding reaction is determinative of a binding reaction that is specific for a herpesvirus associated with KS as opposed to any other herpesvirus (or even any other virus) are identified or described. Without a teaching of which

peptide fragments encoded by portions of SEQ ID NO: 14 are absolutely unique to a herpesvirus associated with KS, the skilled artisan could not make or use the claimed invention.

Unpredictability of the art and Amount of experimentation required: The instant claims require a great deal of empirical, undue and unpredictable trial and error experimentation for the full scope of the claims to be enabled. The skilled artisan would need to empirically determine each polypeptide encoded by SEQ ID NO: 14, and then determine which of these polypeptides are not present in any of the other known proteins. Even if the polypeptide is found once outside the context of a KS-associated herpesvirus, it cannot be considered to be determinative of a herpesvirus associated with KS.

In conclusion, it certainly appears that the full-length protein encoded by SEQ ID NO: 14 uniquely defines a herpesvirus associated with KS. However, there are no teachings in either the prior art or in the instant specification which define which regions of the polypeptide that are not present in any other protein. As a result the skilled artisan would have to perform trial and error experimentation of an undue nature to effectively define the broad scope of the claimed invention. As a result, the broad scope cannot be considered enabled, because

it cannot be made (and therefore amount be used) without a burdensome amount of trial and error experimentation.

Response to Arguments

Although this is a new rejection not necessitated by Applicant's amendment, Examiner has taken into consideration Applicant's arguments of record in response to the previous enablement rejection.

Applicant's representative has argued that claim 52 is directed to an isolated peptide encoded by a nucleotide sequence of at least 30 nucleotides in length and within SEQ ID NO: 14, i.e., that the peptide must be ≥ about 10 amino acid residues long.

Applicant's representative has also argued that just as techniques in the art can be used to identify peptides encoded by fragments of SEQ ID NO: 14 which do not uniquely define a herpesvirus associated with KS, the same techniques can also be used to identify peptides of ≥ 10 amino acids encoded by fragments of SEQ ID NO: 14 which *do* define a KS-associated herpesvirus.

Applicant's representative has also argued that the vast array of ≥ 30-nucleotide long sequence can be readily identified from the disclosure of the SEQ ID NO: 14 sequence in the subject

application and that out of the peptides encoded by this vast array, peptide sequences that uniquely define a herpesvirus associated with KS can be easily identified by comparison with peptide databases, for example, by performing a BLAST search. Applicant's representative further argued that such procedure is routinely done in the art and does not require any undue experimentation.

The arguments presented have been fully considered but are respectfully found unpersuasive.

First, Examiner does not interpret the portion of claim 52 which recites "[a]n isolated peptide (i) encoded by a nucleic acid of at least 30 nucleotides in length having a sequence which constitutes a portion of the sequence set forth in SEQ ID NO: 14" to be limited to peptides of ≥ about 10 amino acid residues long. Given it's broadest reasonable interpretation this portion of claim 52 encompasses peptides encoded by any nucleic acid of 30 nucleotides in length as long as the nucleic acid includes adenine, since adenine is a portion of SEQ ID NO: 14. The claim does not specify that the rest of the nucleic acid encode for any amino acid. However, the peptide encoded by the portion of SEQ ID NO: 14 need be large enough to bind to an antibody as determined by lines 4-6 of claim 52 which recite "and (ii) which binds to an antibody in a binding reaction that

is determinative of a herpesvirus associated with Kaposi's sarcoma."

Second, similar to a written description rejection, the ability to identify a polypeptide is not the standard for meeting the enablement requirement. In order for the enablement requirement to be met, the skilled artisan must be able to make and use the claimed invention. However, if the invention has yet to be identified, one of skill in the art cannot make the invention. Without a teaching of which peptide fragments encoded by portions of SEQ ID NO: 14 are capable of binding to an antibody such that the binding reaction is determinative of a herpesvirus associated with KS (i.e., the peptides capable of distinguishing a herpesvirus associated with KS from any other herpesvirus), the skilled artisan could not make or use the claimed invention.

Claims 52-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. **This is a new matter rejection.**

The specification as originally filed does not provide support for the invention as now claimed: "an isolated peptide …which binds to an antibody in a binding reaction that is determinative of a herpesvirus associated with Kaposi's sarcoma, which herpesvirus …(b) has a genome having substantial sequence identity with the sequence set forth in SEQ ID NO: 1 (claim 52) or a composition which comprises such a peptide and a carrier (claim 53). The specification does not provide sufficient blazemarks nor direction for the instant peptides encompassed by the above-mentioned limitation, as currently recited. The instant claims now recite a limitation, which was not clearly disclosed in the specification as filed, and now change the scope of the instant disclosure as filed. Such a limitation recited in the present claims, which did not appear in the specification as filed, introduce new concepts and violate the description requirement of the first paragraph of 35 U.S.C. 112.

Conclusion

Certain papers related to this application may be submitted to the Art Unit 1636 by facsimile transmission. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. § 1.6(d)). The official fax telephone number for the Group is (571) 273-8300. Note: If

Applicant *does* submit a paper by fax, the original signed copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers in the Office.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent applications to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at (800) 786-9199.

Any inquiry concerning rejections or objections in this communication or earlier communications from the examiner should be directed to Walter A. Schlapkohl whose telephone number is

(571) 272-4439. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. A phone message left at this number will be responded to as soon as possible (i.e., shortly after the examiner returns to his office.)

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Remy Yucel can be reached at (571) 272-0781.

NANCY VOGEL, PH.D.
PATENT EXAMINER

Walter A. Schlapkohl, Ph.D.
Patent Examiner
Art Unit 1636

February 15, 2006